Dräger medical
A Dräger and Siemens Company

Technical Documentation

Fisher & Paykel® MR 850
Respiratory Humidifier

Revision 5.0
5697.500
9036209

Contents

General

1 Symbols and Definitions 3

2 Notes 3

Function Description

1 MR 850 Respiratory Humidifier 7

1.1 Humidifier Operation 7

1.2 Operating Modes 8

1.2.1 Stand-by mode 8

1.2.2 Intubated mode 8

1.2.3 Mask mode 8

1.3 Controls 9

1.3.1 On/off button 9

1.3.2 Mode button 9

1.3.3 Mute button 9

1.4 Optical Indicators 10

1.4.1 Display 10

1.4.2 Humidity alarm (lung symbol) 10

1.4.3 Warning triangle alarm 10

1.5 Setup Indicators (LEDs) 10

1.5.1 Temperature probes 10

1.5.2 Heater wire adapter 10

1.5.3 Temperature probe connectors 11

1.5.4 Humidification chamber temperature probe alarm with probe connector alarm 11

1.5.5 Airway temperature probe alarm with probe connector alarm 11

1.5.6 Water out LED 11

1.6 Operational Alarms 11

1.6.1 Humidity alarm (lung symbol) 11

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Contents

Annex

Parts catalog

Test List

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General

1 Symbols and Definitions

WARNING

A WARNING statement provides important information about a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

A CAUTION statement provides important information about a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.

NOTE

A NOTE provides additional information intended to avoid inconvenience during operation.

Definitions according to German standard DIN 31051:

Inspection	=	examination of actual condition
Maintenance	=	measures to maintain specified condition
Repair	=	measures to restore specified condition
Servicing	=	inspection, maintenance, and repair

2 Notes

This Technical Documentation conforms to the IEC 60601-1 standard.

Read each step in every procedure thoroughly before beginning any test. Always use the proper tools and specified test equipment. If you deviate from the instructions and/or recommendations in this Technical Documentation, the equipment may operate improperly or unsafely, or the equipment could be damaged.

It is our recommendation to use only Dräger parts and supplies.

The maintenance procedures described in this Technical Documentation may be performed by qualified service personnel only. These maintenance procedures do not replace inspections and servicing by the manufacturer.

The information in this Technical Documentation is confidential and may not be disclosed to third parties without the prior written consent of the manufacturer.

This Technical Documentation is for the purpose of information only. Product descriptions found in this Technical Documentation are in no way a substitute for reading and studying the Instructions for Use/Operating Manual enclosed with the product at the time of delivery.

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Know-how contained in this Technical Documentation is subject to ongoing change through research and development and Dräger Medical reserves the right to make changes to this Technical Documentation without notice.

NOTE
Unless otherwise stated, reference is made to laws, regulations or standards (as amended) applicable in the Federal Republic of Germany for equipment used or serviced in Germany. Users or technicians in all other countries must verify compliance with local laws or applicable international standards.

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Function Description

1 MR 850 Respiratory Humidifier

The MR 850 Respiratory humidifier is designed to add heat and moisture to the respiratory gas delivered to the patient. The humidifier can be connected to various ventilators. It supports CPAP ventilation, delivery of other medical gases, intubation and mask ventilation.

Figure 1 MR 850 Respiratory Humidifier

1.1 Humidifier Operation

The respiratory gas flows into the humidification chamber. A heater plate heats the sterile, pyrogen-free water contained in the humidification chamber. The heater plate is located below the humidification chamber. The heated water humidifies the respiratory gas. A temperature probe at the humidification chamber outlet measures the respiratory gas temperature. The measurement signal is transmitted to a control circuitry. This control circuitry controls the amount of power delivered to the heater plate in order to maintain the respiratory gas temperature at a constant level.

The heated and humidified respiratory gas travels through the inspiratory limb. The inspiratory limb has a heater wire inside. A temperature probe measures the patient's respiratory gas temperature. The opening of this temperature probe is located at the end of the inspiratory limb near the patient. The measurement signal from the temperature probe is transmitted to a control circuitry. This control circuitry controls the power delivered to the heater wire in order to maintain the respiratory gas temperature at the inlet and outlet of the inspiratory limb at a constant level. This prevents the humidity contained in the respiratory gas from condensing in the inspiratory limb.

An expiratory limb heater wire must also be used in order to stop the patient's expired humidity from condensing into the expiratory limb of the breathing circuit.

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1.2 Operating Modes

1.2.1 Stand-by mode

Depending on the severity of the alarm condition, the humidifier will either enter stand-by mode or remove all power from the heating systems (heater plate, heater wire(s)).

The humidifier will generate an audible alarm and always enter stand-by mode if the following occurs:

– Malfunction/error during operation
– Incorrect settings
– Gas flow in breathing circuit stops

In stand-by mode the following occurs:

– Heater wire power is set to 30 %
– Heater plate temperature is limited to 60 °C
– Heater plate power is limited to 20 %

1.2.2 Intubated mode

”Intubated” is the default mode on power on of the humidifier. This mode is for use with patients who need to be ventilated mechanically. The humidifier delivers an optimally humidified respiratory gas of 44 mg/L to the patient. The respiratory gas temperature is almost the same as the patient’s core temperature (37 °C).

If ambient conditions change, e.g. due to cold or drafts, the temperature can be reduced in steps to 35 °C in order to prevent condensate buildup in the inspiratory limb.

1.2.3 Mask mode

”Mask” mode is suitable for patients who are receiving gas via a face mask (O2 therapy, CPAP). In this mode the patients receive respiratory gas that has an adequate humidity level (to compensate for the unphysiologically high gas flow rate).

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1.3 Controls

1.3.1 On/off button

If the on/off button is held down briefly, the humidifier will toggle on or off. After power-on the humidifier starts an internal diagnostic routine (self test). An audible signals tells the user when the self test is completed.

1.3.2 Mode button

When held down for one second, the mode button toggles the humidifier between mask mode and intubated mode.

1.3.3 Mute button

The mute button silences the humidifier's audible alarm. The muted time depends on the alarm condition and the type of alarm.

Both the chamber temperature and then the airway temperature can be displayed by pushing and holding the mute button for 1 second. The display will return to airway temperature after a few seconds.

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1.4 Optical Indicators

1.4.1 Display

The display shows the saturation temperature of the delivered respiratory gas in °C. Normally, it is the temperature of the humidification chamber (in intubated mode approx. 37 °C, in mask mode approx. 30 °C)

1.4.2 Humidity alarm (lung symbol)

The humidifier will generate an audible and visual alarm if the temperature in the humidification chamber is above 41 °C or the respiratory gas temperature is above 43 °C.

The humidifier generates a visual and audible alarm if in intubated mode a low level of humidity is being delivered to the patient for too long.

The humidity alarm may be caused by ambient conditions (cold, drafts) or can result from too high or too low gas flow rates.

1.4.3 Warning triangle alarm

The warning triangle indicates a serious hardware fault.

WARNING

If the warning triangle on the MR 850 Respiratory Humidifier comes on, immediately take the humidification chamber and the breathing circuit out of service.

1.5 Setup Indicators (LEDs)

The setup indicators (LEDs), placed on the lower left of the front panel, light when the humidifier and its accessories are not set up correctly.

1.5.1 Temperature probes

These LEDs will light if the temperature probes (humidification chamber, airway) are not correctly plugged into the breathing circuit or the humidifier.

After power-on or fast changing of temperature values, the humidifier checks whether the temperature probes are plugged in or not by first cooling down then heating up the respiratory gas.

If the humidifier finds that either probe is not inserted into the breathing circuit, an alarm will be generated and the humidifier will enter stand-by mode. During this alarm the humidifier will initiate a probe out test periodically, or a test will be initiated immediately after mute has been pressed.

During periods of low or zero gas flow, the airway probe out alarm is disabled. As soon as flow is detected however, an airway probe test is initiated.

1.5.2 Heater wire adapter

The heater wired adapter indicator will light under the following conditions:

- Heater wire adapter not connected correctly
- Breathing circuit is faulty or not connected correctly
- There is an intermittent connection
- Excessive current in the heater wires (total current in all limbs greater than 3.5 A)

The humidifier will remove power from the heating system if the heater wire adapter alarm is active.

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1.5.3 Temperature probe connectors

The temperature probe LEDs will light under the following conditions:

– Temperature probes are not connected correctly to the humidifier

– Temperature probes are faulty

The humidifier checks whether the temperature probes are open or short circuited.

1.5.4 Humidification chamber temperature probe alarm with probe connector alarm

The humidifier checks to see if the humidification chamber temperature probe is faulty by testing for the following conditions:

– Humidification chamber temperature is greater than 80 °C.

– Humidification chamber temperature has been greater than 50 °C for 20 minutes.

If an apparent fault is found, the humidifier will give a probe connector alarm and the LED of the humidification chamber temperature probe will light. The humidifier will stay in stand-by mode until the temperature at the humidification chamber temperature probe drops below 50 °C.

1.5.5 Airway temperature probe alarm with probe connector alarm

The humidifier checks to see if the airway temperature probe is faulty by testing for the following conditions:

– Airway temperature is greater than 80 °C.

– Airway temperature has been greater than 50 °C for 5 minutes.

If an apparent fault is found, the humidifier will give a probe connector alarm and the LED of the airway temperature probe will light. The humidifier will stay in stand-by mode until the temperature at the airway temperature probe drops below 50 °C.

1.5.6 Water out LED

The water out LED indicates that there is insufficient water in the humidification chamber.

The humidifier controls the amount of power required to maintain the set chamber temperature at a constant level.

If a lower than expected amount of power is required, the humidifier will generate a visual and audible water out alarm.

With greater changes in flow it may take 15 minutes or longer to generate a water out alarm.

The water out alarm can be cancelled for 1 minute by pressing the mute button. If however the water out condition remains, the humidifier will re-alarm.

1.6 Operational Alarms

These alarms are generated if problems occur with the operation of the humidifier.

1.6.1 Humidity alarm (lung symbol)

A humidity alarm will occur if the displayed temperature is too high, or if the delivered humidity (intubated mode only) has been low for a period of time. The humidifier will generate a visual and audible alarm if the humidification chamber temperature exceeds 41 °C or the airway chamber exceeds 43 °C. If these high temperature alarms occur, the humidifier will immediately shut down the heater wire and the heater plate.

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Low humidity warning and alarm

The low humidity warning and alarm are disabled during warm-up and no flow conditions.

The lung symbol lights when a low level of humidity is being delivered to the patient. The audible alarm alerts the user that a low level of humidity has been delivered to the patient for too long.

The humidification chamber temperature probe controls the humidity low warning or alarm.

If the humidification chamber temperature is below 35.5 °C for 25 seconds, the lung symbol will light. If the temperature remains below this level for too long, then a low humidity alarm is activated.

The time taken for the humidifier to alarm is dependent on how far below the 35.5 °C threshold the temperature is.

The following Figure shows the relationship between temperature and the time before a warning or alarm is generated:

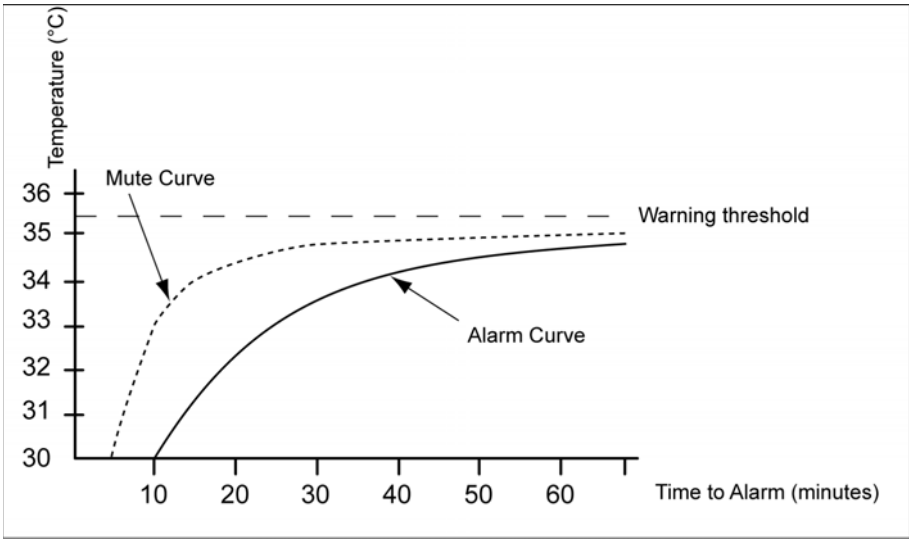

Figure 2 Temperature vs time to alarm

Pressing the mute button silences the audible low humidity alarm for 1 minute if the same temperature of the humidification chamber temperature probe is maintained.

The low humidity warning and alarm can occur under the following conditions:

– Cold
– Drafts
– Gas flow rates outside specification of breathing circuit
– Gas flow rates outside specification of humidification chamber
– Gas flow rates outside specification of humidifier.

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Annex

Parts catalog

Test List

Dräger medical
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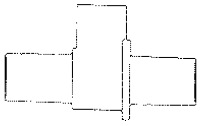
Parts catalog

Fisher&Paykel MR 850

Revision: 2006-03

5697.500

900MR156



Dräger Temperature Probe Housing

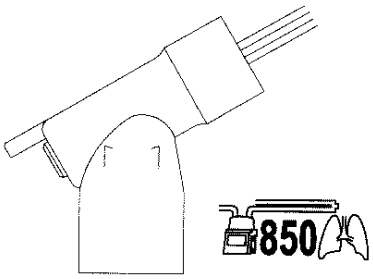
11mm M to 11mm M

Available each

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8411044	PROBE-THERMOMETER HOUSING DRAE	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR755



Heater Wire

For low flow/volume regulated neonatal ventilators
20 ohms 24W
1.05m (41")

Use with reusable delivery tubing approximately 1.1m (43") in length

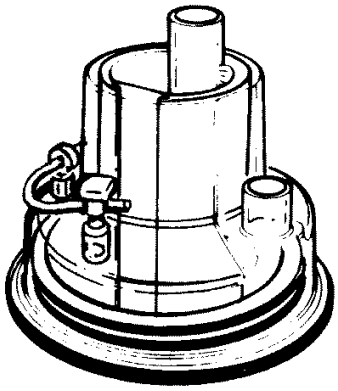
Available each

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8411045	HOSE HEATER 1,10 M	1.000	St	

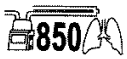
Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

MR340

Neonatal/Paediatric Humidification Chamber

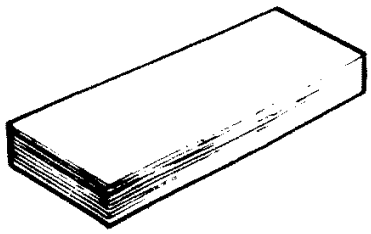


Inlet Port 15mm F
Outlet Port 22mm M



900MR065

Absorbent Paper Refill Pack

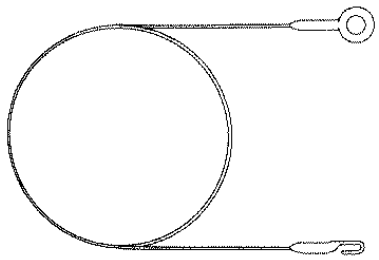


For use with MR340 Humidification chamber
Each pack contains 100 sheets

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8411047	HUMIDIFIER CHAMBER MR 340	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR070



Draw Wire

900MR070 1.5m (60")

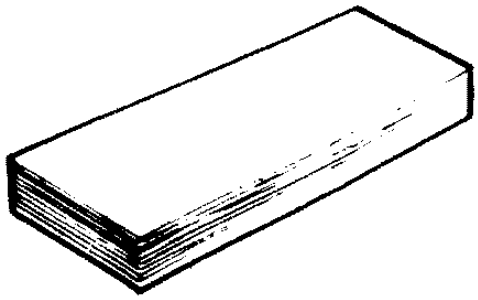
For use with reusable heater wire assemblies
Used to draw the heater wire into reusable tubing

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8411050	DRAW WIRE 1,50 M 900 MR 070	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR065

Absorbent Paper Refill Pack

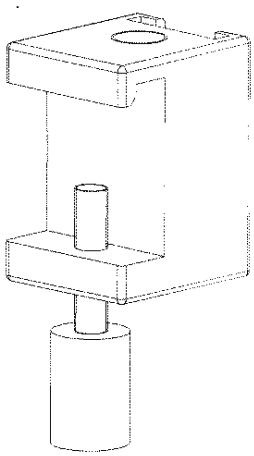


For use with MR340 Humidification chamber
Each pack contains 100 sheets

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8411073	ABSORBENT PAPER REFILL PACK	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR088



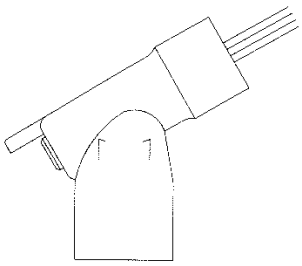
Rail Bracket

For mounting the humidifier and a water bag pole to Dräger and Siemens ventilators, or to 25mm x 10mm rails.

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8411074	MOUNTING KIT F&P	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR524



Heater Wire

High frequency heater wire
29.7 ohms 17W
0.7m (28”)

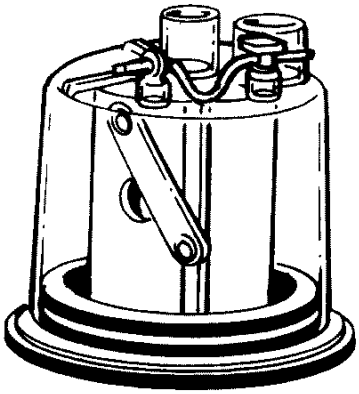
Use with reusable delivery tubing approximately 0.8m (30”) in length for high frequency ventilation

Available each

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8411154	HEATER WIRE 0,70M HFV-F&P	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

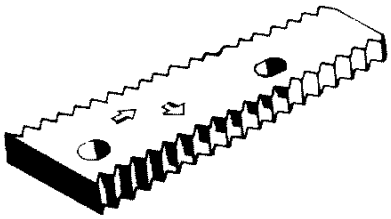
MR370



Adult Humidification Chamber

Inlet Port 22mm F
Outlet Port 22mm M

900MR066



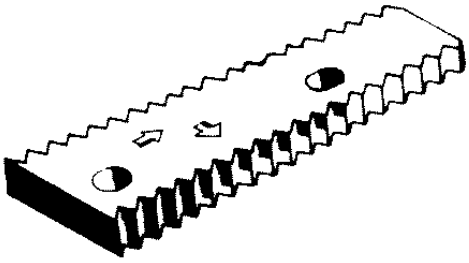
Absorbent Paper Refill Pack

For use with MR370 Humidification chamber
Each pack contains 100 sheets

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8412217	HUMIDIFIER CHAMBER MR 370 (A)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR066

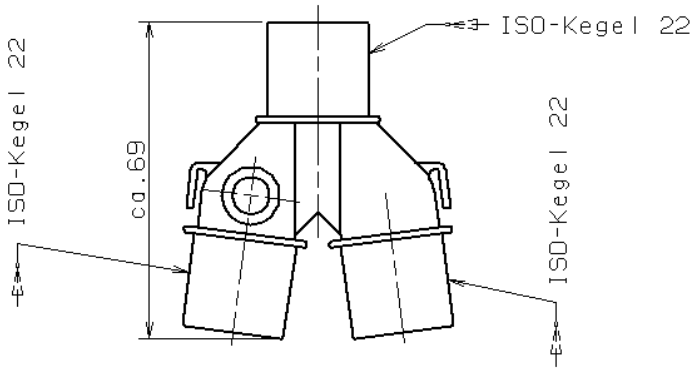


Absorbent Paper Refill Pack

For use with MR370 Humidification chamber
Each pack contains 100 sheets

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8412218	ABSORBENT PAPER	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts



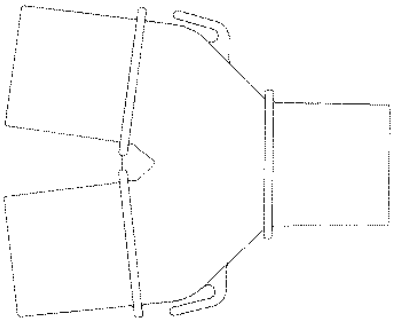
autoklavierbar bis 134°C

Hersteller :
Fisher + Paykel
Best.-Nr.: 900 MR 127

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8412220	Y-PIECE F+P	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR126



Adult Y-Piece

No Ports
Circuit connections - 22mm M
Patient connection - 22mm M / 15mm F

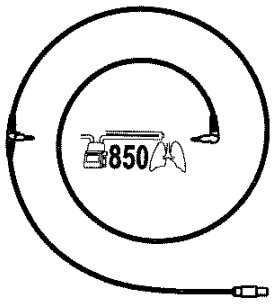
Available in:

900MR126	Each
900MR126L	Packs of 50
900MR126C	Packs of 100

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8412888	Y-PIECE	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR 869



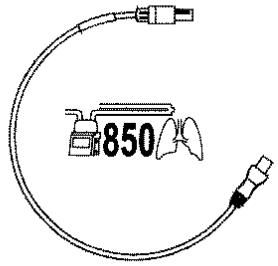
Temperature/Flow Probes for
MR850 Humidifier
right angle airway probe

900MR869 for use with circuits 1.5m (60”) in length

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414966	Temperature probe 900 MR 869	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR858



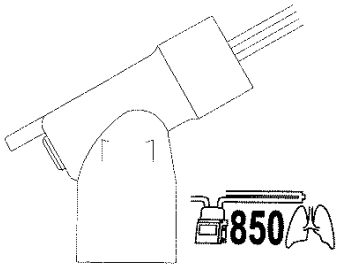
Single Heater Wire Adapter for reusable circuits Lemo® style

For use with the MR850 Humidifier when paired with a single heated, reusable circuit

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414968	Adapter hose heater MR850 reus	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR751



Heater Wire

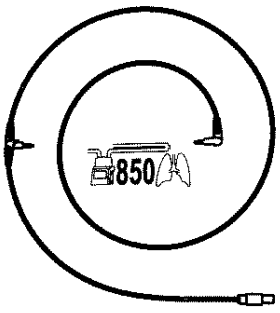
Heater wire assembly
17 ohms 25W
1.45m (58”)
Use with reusable delivery tubing approximately 1.5m (60”) in length
Compatible with MR850 and MR730 heater bases

Available each

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414969	Hose heater 900 MR 751	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR860-869



Temperature/Flow Probes for MR850 Humidifier right angle airway probe

900MR868 for use with circuits 1.1m (44”) in length

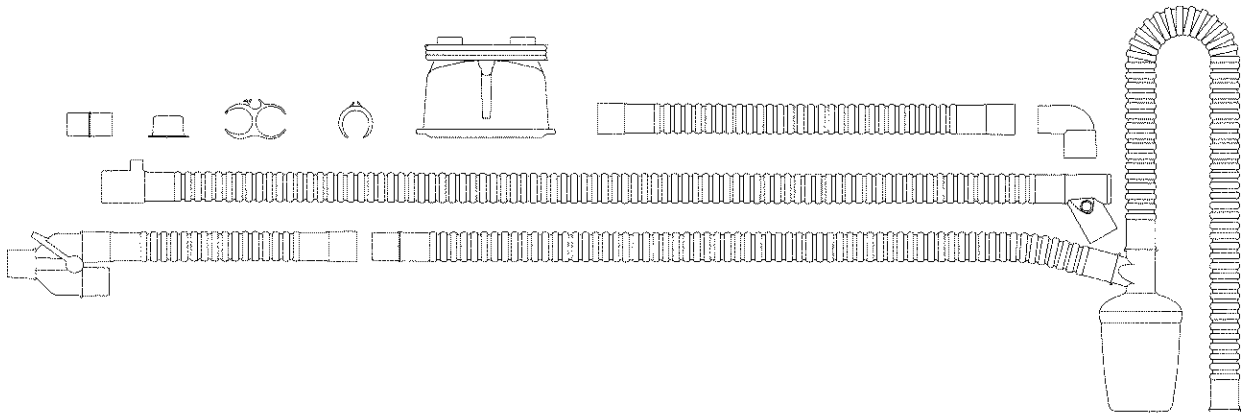
Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414989	Temp./flowsensor 900 MR 868	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

RT212

Adult Breathing Circuit
single heated with autofeed chamber

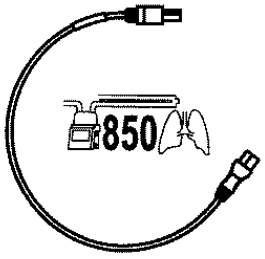
1.5m heated inspiratory limb
2.0m unheated expiratory limb with water trap
0.5m humidifier connection tube
MR290 humidification chamber
25W
Available in cartons of 10



Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414991	Hose kit for MR 850, RT 212 (10pcs)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR801



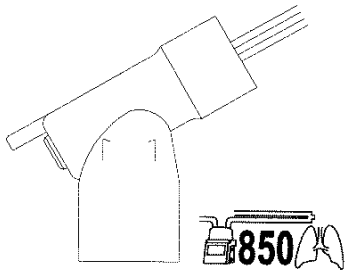
Heater Wire Adapter for “RT series” inspiratory heated breathing circuits

For use with the MR850 Humidifier

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414992	Hose heater adapter 900 MR 801	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR754



Heater Wire

For neonatal bias flow/ pressure regulated ventilators
18 ohms 27W
0.95m (39")

Use with reusable delivery tubing approximately 1.1m (43") in length

Available each

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414993	Hose heater 900 MR 754	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414994	Hose kit for MR 850, RT 225 (10pcs)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Adult:

Dräger Schlauchset für MR 850, reusable

2 Atemschlauch E 60CM 21 65 627
1 Atemschlauch E 110CM 21 65 635
1 Atemschlauch E 35CM 21 65 619
1 Faltenschlauch 84 02 041
1 Doppeltuelle 22/22.....M 25 647
1 Maskenkruemmer .....M 25 649
1 Wasserfalle 84 04 985
1 Konnektor f. Trachealtub. 12.5 .....M 23 840
1 Adapter E 84 03 076
1 Satz Kathederstutzen,E 84 03 685
1 Kappe 84 01 644
1 Y-Stück F+P84 12 220
1 Schlauchklammer.....84 03 566
1 Schlauchheizung 1.10m 84 11 045

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414986	Hose kit adult	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

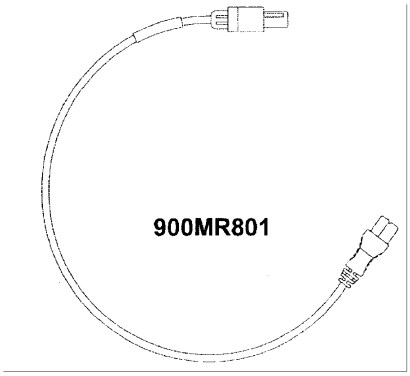
Paediatric:

Dräger Schlauchset für MR 850, reusable

1 Kappe 84 01 645
2 Faltenschlauch flex. 84 09 634
1 Temp. Sensoraufnahme 84 11 044
1 Atemschlauch K 22/10 1.1M 21 65 651
1 Atemschlauch K 22/10 0.6M 21 65 821
1 Atemschlauch K 22/10 0.4M 21 65 856
1 Atemschlauch K 10/10 0.6M 21 65 848
1 Konnektor f. Trachealtub. 11 ..... M 19351
1 Testlunge, kompl. 84 09 742
1 Y-Stück 90 grad 84 03 075
1 Doppelkonus 11a 84 09 897
1 Kondensatabscheider EX 84 09 627
1 Schlauchheizung 900MR754 84 14993

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414987	Hose kit paediatric	1.000	St	

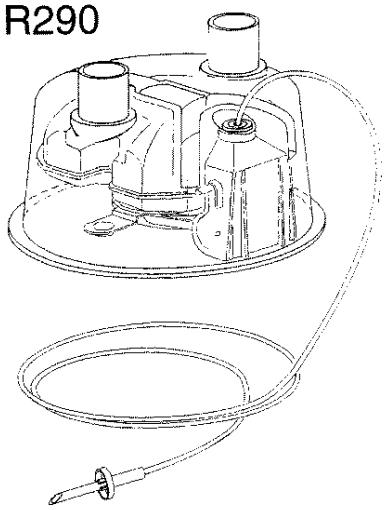
Items that are shown in the illustration but are not listed below the illustration are not available as spare parts



Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8414967	Adapter hose heater MR850 disp	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

MR290



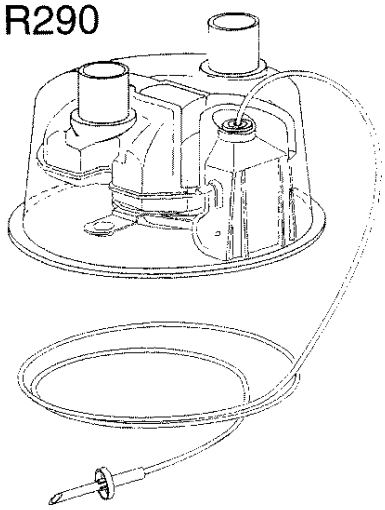
Autofeed Adult/Paediatric/Neonatal Humidification chamber

Inlet Port	22mm M
Outlet Port	22mm M
MR290UX	Cartons of 10 (for water bags)

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418282	F&P MR290 disp.chamber (10p.)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

MR290



Autofeed Adult/Paediatric/Neonatal Humidification chamber

Inlet Port	22mm M
Outlet Port	22mm M

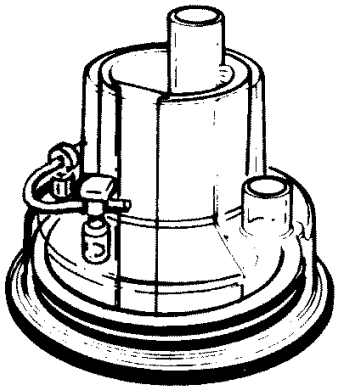
MR290U	Cartons of 40 (for water bags)

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418283	F&P MR290 Disp.Chamber (40pcs)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

MR340

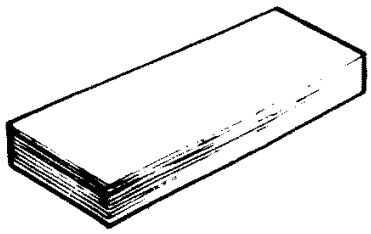
Neonatal/Paediatric Humidification Chamber



Inlet Port	15mm F
Outlet Port	22mm M

900MR065

Absorbent Paper Refill Pack

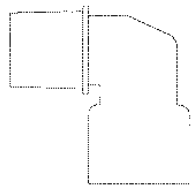


For use with MR340 Humidification chamber
Each pack contains 100 sheets

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418286	F&P MR 340 Kammer (d)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR130



Elbow Adapter

22mm F to 22mm M / 15mm F

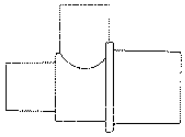
Available in:

900MR130	Each
900MR130L	Packs of 50
900MR130C	Packs of 100

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418289	F&P adapter 22f/22m+15f	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR146



Temperature Probe Housing

10mm M to 15mm M / 10mm F

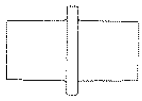
Available in:

900MR146	Each
900MR146C	Packs of 100

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418405	Temperature sensor housing D15/D10	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR533



Adapter

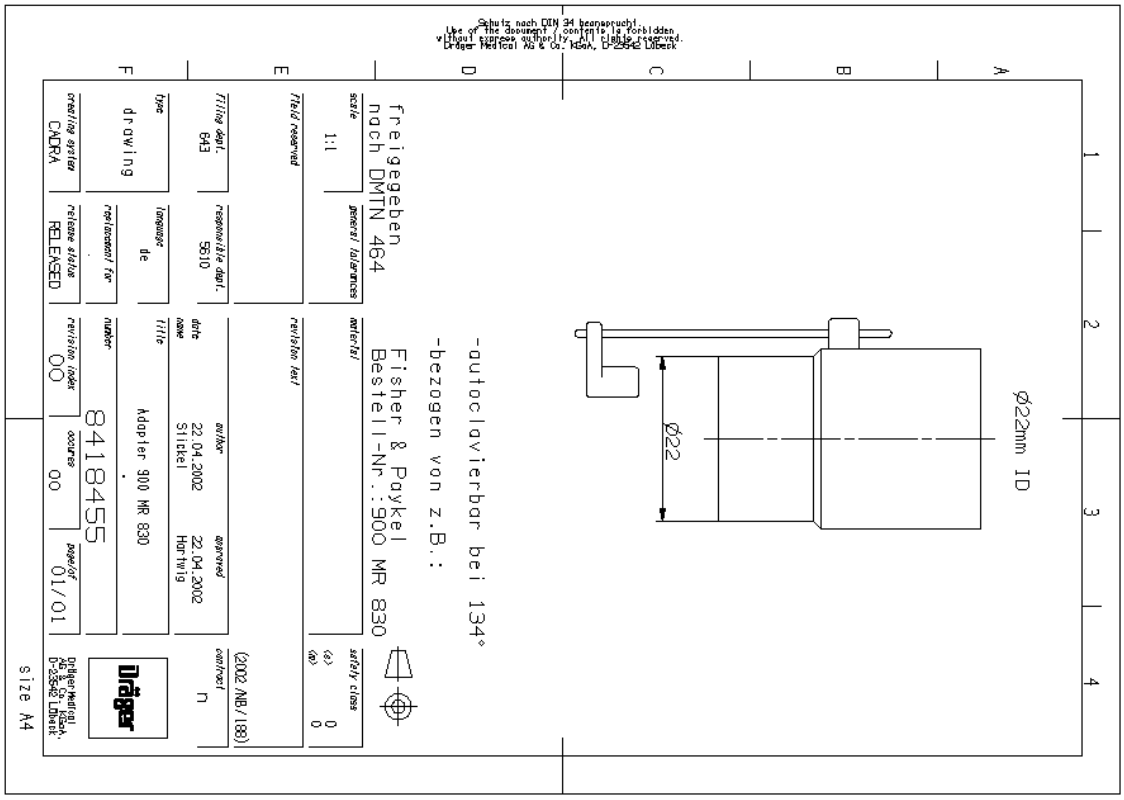
15mm M / 10mm F to 15mm M / 10mm F

Available in:

900MR533	Each
900MR533L	Packs of 50
900MR533C	Packs of 100

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418407	Adapter 900 MR 533	1.000	St	

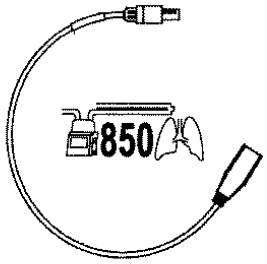
Items that are shown in the illustration but are not listed below the illustration are not available as spare parts



Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418455	Adapter 900 MR 830	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR859



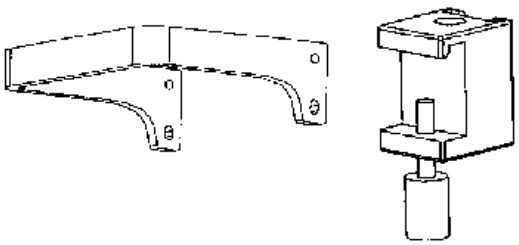
Heater Wire Adapter for 3rd Party inspiratory heated breathing circuits (Molex® style)

For use with the MR850 humidifier

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	MP01001	Heater Wire Adapter (Molex)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

900MR305



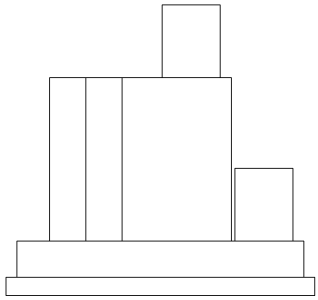
Dräger mounting bracket

For mounting the humidifier to the Evita 4/XL ventilators

This setup includes the 900MR088

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	MP01002	Mounting bracket F&P	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts



Fisher&Paykel
Bestell Nr.
order-no: MR 340 F - Fre/Ger/Dut
beinhaltet
contains
100 Blatt Papier/ 100 pcs paper
Bestell-Nr./order-no 900MR065

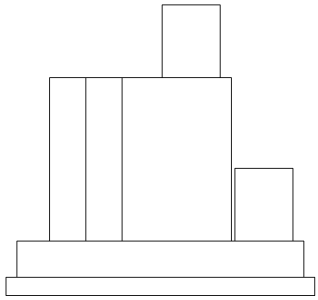
Komprimierbares Volumen: 130 mL bis 360 mL
Max. Wasserkapazitaet: 230 mL
Max. Gasflow: 70 L/min
Widerstand: 0,2 mbar bei 30 L/min

Compliance
voll/full 0,3 mL/mbar
leer/empty 0,5 mL/mbar

autoklavierbar/auto-clavable bei/at 134°C/2,2 bar/4 min
oder 120°C/0,96 bar/15 min

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418526	Humidifier chamber MR 340 (fr)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts



Fisher&Paykel
Bestell Nr.
order-no: MR 340 F - Ita/Spa/Por
beinhaltet
contains
100 Blatt Papier/ 100 pcs paper
Bestell-Nr./order-no 900MR065

Komprimierbares Volumen: 130 mL bis 360 mL
Max. Wasserkapazitaet: 230 mL
Max. Gasflow: 70 L/min
Widerstand: 0,2 mbar bei 30 L/min

Compliance
voll/full 0,3 mL/mbar
leer/empty 0,5 mL/mbar

autoklavierbar/auto-clavable bei/at 134°C/2,2 bar/4 min
oder 120°C/0,96 bar/15 min

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
	8418527	Humidifier chamber MR 340 (es)	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Humidifier base unit Anfeuchter Grundeinheit	P/N Sach.-Nr.	Voltage in V Spannung in V	Current consumption Stromaufnahme	Front/side labeling Front/Seitenfolie	Power plug Netzstecker	Contains Instructions for Use in Beinhaltet Gebrauchsanweisungen in
MR 850 ADU	8418514	230 V +/-20V	1.0 A	Dan	Danish	Danish
MR 850 AEA	8418515	230 V +/-20V	1.0 A	Eng	NZ/AUS	English
MR 850 AEK	8418516	230 V +/-20V	1.0 A	Eng	UK	English
MR 850 AEU	8414719	230 V +/-20V	1.0 A	Eng/Spa/Fre	Euro	English+Spanish+French
MR 850 AFU	8418517	230 V +/-20V	1.0 A	Fre/Dut/Ger	Euro	French+Dutch+German
MR 850 AGU	8414720	230 V +/-20V	1.0 A	Ger/Fre/Ita	Euro	German+French+Italian
MR 850 ALU	8418518	230 V +/-20V	1.0 A	Ita/Spa/Por	Euro	Italian+Spanish+Portuguese
MR 850 ANU	8418519	230 V +/-20V	1.0 A	Nor/Swe/Fin	Euro	Norwegian+Swedish+Finnish
MR 850 ARU	8418520	230 V +/-20V	1.0 A	Eng/Rus/Pol	Euro	English+Russian+Polish
MR 850 GJU	8418521	100 V +/-10V	2.4 A	Jap	US straight plug	Japanese
MR 850 JHU	8418522	115 V +/-10V	2.0 A	Eng/Spa/Fre	US right angle plug	English US+Spanish+French
MR 850 JSU	8418523	115 V +/-10V	2.0 A	Spa/Por/Eng	US right angle plug	Spanish+Portuguese+English US

Labeling Humidifier Chamber Schilder Befeuchterkammer	P/N Sach-Nr.
MR 340 F: in Fre/Ger/Dut	8418526
MR 340 S: in Ita/Spa/Por	8418527
MR 340 E: in Eng/Fre/Ger	8411047

Item No.	Part No.	Description	Qty.	Qty. unit	Remark

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Item No.	Part No.	Description	Qty.	Qty. unit	Remark
1	8418518	Resp. humidifier MR850ALU	1.000	St	
1	8418515	Resp. humidifier MR850AEA	1.000	St	
1	8418519	Resp. humidifier MR850ANU	1.000	St	
1	8418522	Resp. humidifier MR850JHU	1.000	St	
1	8418517	Resp. humidifier MR850AFU	1.000	St	
1	8418521	Resp. humidifier MR850GJU	1.000	St	
1	8418523	Resp. humidifier MR850JSU	1.000	St	
1	8418520	Resp. humidifier MR850ARU	1.000	St	
1	8418516	Resp. humidifier MR850AEK	1.000	St	
1	8418514	Resp. humidifier MR850ADU	1.000	St	
1	8414719	Resp. humidifier MR850 AEU	1.000	St	
1	8418488	Resp. humidifier MR850AEU (ZH)	1.000	St	
1	8414720	Resp. humidifier MR850AGU	1.000	St	

Items that are shown in the illustration but are not listed below the illustration are not available as spare parts

Assembly	Description	Part No.
Absorbent Paper		
	ABSORBENT PAPER REFILL PACK	8411073
Absorbent Paper Set		
	ABSORBENT PAPER	8412218
Adapt. Hoseheater MR850 disp.		
	Adapter hose heater MR850 disp	8414967
Adapter 900MR533		
	Adapter 900 MR 533	8418407
Adapter 900MR830		
	Adapter 900 MR 830	8418455
Adapter Hose Heater		
	Heater Wire Adapter (Molex)	MP01001
Adapter Hose heater MR850		
	Adapter hose heater MR850 reus	8414968
Draw Wire 1,5m		
	DRAW WIRE 1,50 M 900 MR 070	8411050
F&F MR290 Chamber (40pcs)		
	F&P MR290 Disp.Chamber (40pcs)	8418283
F&P Adapter 22f/22m+15f		
	F&P adapter 22f/22m+15f	8418289
F&P MR 340 Chamber (d)		
	F&P MR 340 Kammer (d)	8418286
F&P MR290 Chamber disp.(10pcs)		
	F&P MR290 disp.chamber (10p.)	8418282
Hose Heater 0,7m		
	HEATER WIRE 0,70M HFV-F&P	8411154
Hose heater 1,1m		
	HOSE HEATER 1,10 M	8411045
Hose heater 900MR751		
	Hose heater 900 MR 751	8414969
Hose Heater 900MR754		
	Hose heater 900 MR 754	8414993

Assembly	Description	Part No.
Hose Heater Adapter MR801		
	Hose heater adapter 900 MR 801	8414992
Hose Set E		
	Hose kit adult	8414986
Hose Set K		
	Hose kit paediatric	8414987
Hose Set MR850 RT212		
	Hose kit for MR 850, RT 212 (10pcs)	8414991
Hose SetMR850 RT225		
	Hose kit for MR 850, RT 225 (10pcs)	8414994
Humidifier Basic Unit		
	Resp. humidifier MR850 AEU	8414719
	Resp. humidifier MR850ADU	8418514
	Resp. humidifier MR850AEA	8418515
	Resp. humidifier MR850AEK	8418516
	Resp. humidifier MR850AEU (ZH)	8418488
	Resp. humidifier MR850AFU	8418517
	Resp. humidifier MR850AGU	8414720
	Resp. humidifier MR850ALU	8418518
	Resp. humidifier MR850ANU	8418519
	Resp. humidifier MR850ARU	8418520
	Resp. humidifier MR850GJU	8418521
	Resp. humidifier MR850JHU	8418522
	Resp. humidifier MR850JSU	8418523
Humidifier chamber MR 340(e)		
	HUMIDIFIER CHAMBER MR 340	8411047
Humidifier Chamber MR340(F)		
	Humidifier chamber MR 340 (fr)	8418526
Humidifier Chamber MR340(S)		
	Humidifier chamber MR 340 (es)	8418527
Humidifier Chamber MR370		
	HUMIDIFIER CHAMBER MR 370 (A)	8412217

Assembly	Description	Part No.
Products concerned		
	Resp. humidifier MR850 AEU	8414719
	Resp. humidifier MR850ADU	8418514
	Resp. humidifier MR850AEA	8418515
	Resp. humidifier MR850AEK	8418516
	Resp. humidifier MR850AFU	8418517
	Resp. humidifier MR850AGU	8414720
	Resp. humidifier MR850ALU	8418518
	Resp. humidifier MR850ANU	8418519
	Resp. humidifier MR850ARU	8418520
	Resp. humidifier MR850GJU	8418521
	Resp. humidifier MR850JHU	8418522
Rail Bracket (900MR088)		
	MOUNTING KIT F&P	8411074
Temp. Probe Adapter D15/D10		
	Temperature sensor housing D15/D10	8418405
Temp./Flow probe 900MR868 1,1m		
	Temp./flowsensor 900 MR 868	8414989
Temp.Sensoradapter		
	PROBE-THERMOMETER HOUSING DRAE	8411044
Temperature probe 1,5m		
	Temperature probe 900 MR 869	8414966
U-Shaped mounting bracket		
	Mounting bracket F&P	MP01002
Y-piece		
	Y-PIECE	8412888
Y-Piece F&P		
	Y-PIECE F+P	8412220

Test List (TL)

Fisher & Paykel MR 850

Notes on field of application:

This test list can be processed with standard commercially available test aids and tools, but does not replace the inspections and maintenance work carried out by the manufacturer.

Tests marked with the symbol "(√)" are listed in the "Test List Report" and can be documented there.

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Contents

1 Unit configuration 1
1.1 Serial number (SN) 1

2 Maintenance parts 1

3 Electrical safety 2
3.1 Electrical safety check as perIEC 60-601 2
3.2 Electrical safety check as per VDE 0751 3

4 Function and condition test 4
4.1 Power-on test 4
4.2 Heating and control 5

5 Test equipment 6
5.1 Test equipment subject to calibration 6
5.2 Test equipment not subject to mandatory calibration 6

6 Encs 7

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1 Unit configuration

The following equipment and accessories are additionally required for the following tests on the Fisher & Paykel MR850.

- Hose system
- Hose adapter
- Temperature probes
- Ventilator (flow 10 L/min to 30 L/min)

1.1 Serial number (SN)

(√) **1.1.1 Fisher & Paykel MR 850** **[_____]**

(√) **1.1.2 Software version** **[_____]**

2 Maintenance parts

- Not applicable -

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3 Electrical safety

The following steps describe the electrical safety checks according to IEC 60-601, see section 3.1, and VDE 0751, see section 3.2. Any decision about performing safety checks according to VDE 0751 or IEC 60601 must be made under consideration of applicable national regulations. Electrical safety checks should be carried out either according to IEC 60-601 or VDE 0751.

3.1 Electrical safety check as perIEC 60-601

(√) 3.1.1 Condition test

The Fisher & Paykel MR 850 Respiratory Humidifier and its power cable are not damaged, dirty, or corroded.

[OK]

(√) 3.1.2 Protective earth conductor test

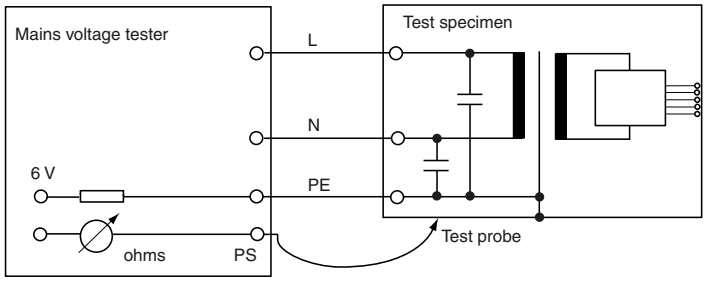

Fig.1 Protective earth conductor test

Description of Fig.1:

A test a.c. voltage of approx. 6 V is applied to the protective earth conductor of the test specimen (Fisher & Paykel MR 850) through a current limiter. Scan conductive humidification chamber heater plate using the test probe. The protective earth conductor resistance is calculated from the flowing current and the voltage present at the test specimen. The PE current is min. 10 A.

CAUTION
The heater plate has a non-conductive coating. Therefore measure the protective earth conductor resistance at the bottom edge of the heater plate.

(√) 3.1.2.1 Heater plate **[_____ohms]**

The test value should be less than/equal to 0.2 ohms.

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3.2 Electrical safety check as per VDE 0751

3.2.1 Condition test

The Fisher & Paykel MR 850 Respiratory Humidifier and its power cable are not damaged, dirty, or corroded.

[OK]

3.2.2 Protective earth conductor test

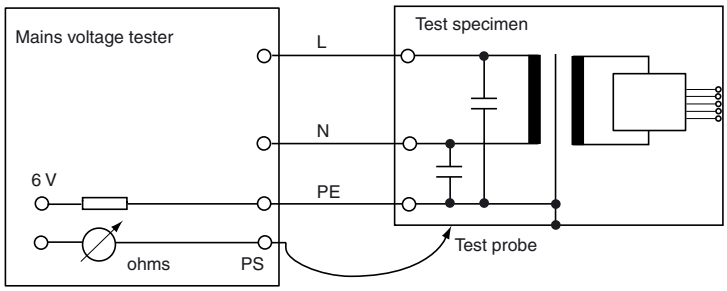

Fig.2 Protective earth conductor test

Description of Fig.2:

A test a.c. voltage of approx. 6 V is applied to the protective earth conductor of the test specimen (Fisher & Paykel MR 850) through a current limiter. Scan conductive humidification chamber heater plate using the test probe. The protective earth conductor resistance is calculated from the flowing current and the voltage present at the test specimen. The PE current is min. 10 A.

CAUTION
The heater plate has a non-conductive coating. Therefore measure the protective earth conductor resistance at the bottom edge of the heater plate.

3.2.2.1 Heater plate **[_____ohms]**

The test value should be less than/equal to 0.2 ohms.

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4 Function and condition test

(√) 4.1 Power-on test

Test equipment: Respiratory humidifier MR 850 with hose adapter and temperature probes.

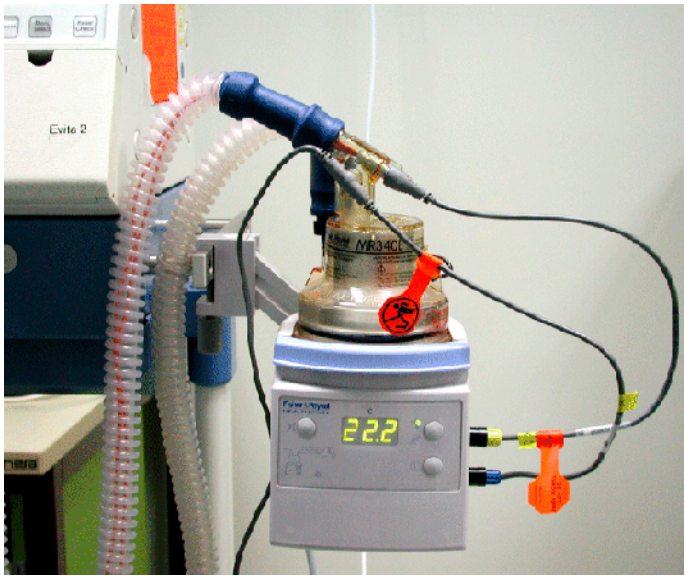

Fig.3 Power-on test set-up

1. Connect the respiratory humidifier MR 850 to the power supply.
2. Turn on the respiratory humidifier MR 850 using the ON/OFF switch.

The unit completes its self-test. All LEDs and the 7-segment displays come on briefly. The audible alarm sounds. The device then enters normal operating mode without any error messages.

3. Turn off the respiratory humidifier MR 850 using the ON/OFF switch.
4. Disconnect the respiratory humidifier MR 850 from the power supply.

[OK]

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4.2 Heating and control

Test equipment: Set up Fisher & Paykel MR 850 respiratory humidifier with breathing circuit, hose adapters, temperature probes, and filled humidification chamber ready for operation. Ventilator delivering a flow rate of 10 L/min to 30 L/min, for example Evita.

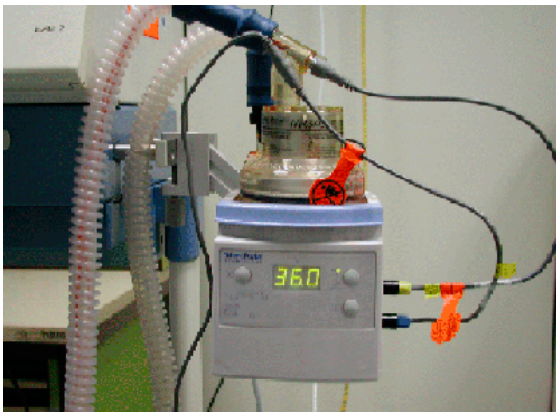

Fig.4 Heating and control test set-up

1. Connect the Fisher & Paykel MR 850 respiratory humidifier to the ventilator.
2. Connect ventilator to power supply.
3. Switch on the ventilator.
4. Connect the Fisher & Paykel MR 850 Respiratory Humidifier to the power supply.
5. Press the power switch on the Fisher & Paykel MR 850 respiratory humidifier.

The warm-up phase is complete after approx. 30 minutes and temperatures have stabilized.

6. Press the “alarm silence” key for 1 second.

The chamber temperature is displayed for approx. 2 seconds, and the chamber LED comes on. Then the airway temperature is displayed for approx. 2 seconds, and the airway temperature LED comes on.

The humidification chamber temperature is in the range 35.2 °C to 37.3 °C.

[OK]

The patient temperature is in the range 38.2 °C to 40.3 °C.

No alarms occur.

7. Switch off the ventilator.
8. Disconnect the ventilator from power supply.
9. Turn off the Fisher & Paykel MR 850 respiratory humidifier using the ON/OFF switch.
10. Disconnect the Fisher & Paykel MR 850 Respiratory Humidifier from the power supply.

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5 Test equipment

5.1 Test equipment subject to calibration

Subject to calibration	Designation	Characteristics/Info
(√)	Mains voltage tester	1.6

5.2 Test equipment not subject to mandatory calibration

Designation	Characteristics/Info	Class
Ventilator	Flow 10 to 30 L/min	1.6
Water container	2 L volume	
Thermometer	+0.5 °C/-0.5 °C	

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6 Encs

- Not applicable -

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Test List Report **Fisher & Paykel MR 850**
Test List Edition: **2001-12-07**
Installation site: _____

OK		Result	OK	Result
( ) 1.1	Serial number (SN)			
( ) 1.1.1	Fisher & Paykel MR850	[_____]		
( ) 1.1.2	Software version	[_____]		
( ) 3.1	Electrical safety check as perIEC 60-601			
( ) 3.1.1	Condition test			
( ) 3.1.2	Protective earth conductor test			
( ) 3.1.2.1	Heater plate	[_____ohms]		
( ) 3.2	Electrical safety check as per VDE 0751			
( ) 3.2.1	Condition test			
( ) 3.2.2	Protective earth conductor test			
( ) 3.2.2.1	Heater plate	[_____ohms]		
4	Function and condition test			
( ) 4.1	Power-on test			
( ) 4.2	Heating and control			

Supply tested and fully functional device to owner/user.
Date: Name/Signature:

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Manufacturer:
Fisher & Paykel Healthcare Limited
15 Maurice Paykel Place, East Tamaki
PO Box 14 348 Panmure Auckland 6
New Zealand

Phone: (+64) 9 574 0100
Fax: (+64) 49 574 0158

Support:
Dräger Medical AG & Co. KG
Moislinger Allee 53 – 55
D-23542 Lübeck
Germany

Phone: (+49) (0) 1805-3723437
Fax: (+49) 451/882 - 3779

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